

SEQUENCE LISTING

SEQ ID NO: 1 (Haemophilus aegyptius)

MKRNLKQSVIAVLIGGTTVSNYALAAQAAQAAQVKKDELSELKKQVKEMDAADGILDQHSAALGRHTNRLNNL
KTIAEKAKGDSSEALDKIEALEEQNDEFADITALEEGVDGLDDIAGIQDNISDIEDDINQNSADIATNTAAIATHQRLDNLDNRV
NNLNKDLKRGAAQALNGLFQPYNVGKLNLTAAVGGYKSQTAVAVG

SEQ ID NO: 2 (Escherichia coli)

MKTVNVALLALIISATSSPVVLAGDTIEAAATELSAINSGMSQSEIEQKITRFLERTDNSPAAYTLYTEHHYIPSETPDTTQTPTVQT
DPDAGQKTVAAATGDVQTTARYQSMINARQSAVTDAQQTQITEQQAQIVATQKTLAATGDTQNTAHYQEMINARLAAQNEANQRTATEQ
GQKMNALTTDVAVQQQNERTQYDKQMQLAQESAQAHEQIDSLSQDVTQTHQQLTNTQKRVADNSQQINTLNNHFSSLKNEVDDNRKE
ANAGTASAIASQPVKTGDVMMVSAGAGTFNGESAVSVGTSFNAGTHTVLKAGISADTOSDFGAGVGVGYSE

SEQ ID NO: 3 (EHEC)

MNKIFKVIWNPATGNYTVTSETAKSRGKKSGRSKLLISALVAGGMLSSFGALANAGNDNGQGVYGSAGDGWVAIGKAKANTFMNTSGSSTAVG
YDAIAEGQYSSAIGSKTHAIGGASMAFGVSAISEGDRSIALGASSYSLGQYSMALGRYSKALGKLSIAMGDSSKAEGANAIALGNATKATEIMSIAL
GDTANASKAYSMALGASSVASEENAIAGAETEAAENATAIGNNAKGTNSMAMGFGSLADKVNTIALGNGSQALADNATAIGQGNKADGVDAIAL
GNGSQSRGLNTIALGTASNATGDKSLALGSNNSANGINSVALGADSIADLDNTVSGNSSLRKIVNVKNGAIKSDSYDAINGSQLYAIISDSVAKRL
GGGAAVDVDDGTVTAPTYNLNGSKNNVGAALAVLDENTLQWDQTKGKYSAAHGTSSPTASVITDVADGTISASSKDAVNGSQLKATNDDVEANTAN
IATNTSNIATNTNIATNTTNTNLTDSVGDLOQADALLWNETKKAFSAAHGQDTSKITNVKDADLTADSTDAVNGSQLKTTNDAVATNTTNIANNT
SNIATNTNIISNLTETVTNLGEDALKWDKDNGVFTAAGTETTSKITNVKDGDLTTGSTDAVNGSQLKTTNDAVATNTTNIATNTTNIISNLTETVTN
LGEDALKWDKDNGVFTAAGNNTASKITNILDGTVTATSSDAINGSQLYDLSSNIATYFGGNASVNTDGVTGPTYKIGETNYYNVGDALAAINSF
STSLGDALLWDATAGKFSAKHGTNGDASVITDVADGEISDSSSDAVNGSQLHGVSSYVVDALGGAEVNADGTITAPTYTIANADYDNVGDALNAID
TTLDDALLWDADAGENGAFSAAHGKDGTASVITNVANGAISAASSDAINGSQLYTTNKYIADALGGDAEVNADGTITAPTYTIANAEYNVGDALDA
LDDNALLWDETANGGAGAYNASHDGKASIITNVANGSISEDSTDATVNGSQLNATNMMIEQNTQIINQLAGNTDATYIQENGAGINYVRTNDDGLAFN
DASAQGVGATAIGYNSVAKGDSSVAIGQGSYSDVDTGIALGSSSVSSRVIAKGSRDTSETENGVIVYDFTDGEELLGALSIGDDGKYRQIINVADGS
EAHDATVRLQNAIGAVATTPTKYFHANSTEEDSLAVGTDLSLAMGAKTIVNGDKIGIGIGYAYVDANALNGIAIGSNAQVIHVNSIAIGNGTTTR
GAQTNYTAYNMDAPQNSVGEFSVGSADGQRQITNVAAGSADTDATVNGQLKVTDAQVSQNTQSITLDNRVTNLDUSRVTNIENGIGDIVTTGSTKYF
KTNTDGVDASAQGKDSVAIGSGSIAAADNSVALGTGSVATEENTISVGSSTNQRRITNVAAGKNATDAVVAQLKSSEAGGVRYDTKADGSIDYSNI
TLGGGNGGTTRISNVSAGVNNNDVVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVA
LGVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIQW

5 **SEQ ID NO: 4 (*Actinobacillus actinomycetemcomitans*)**

MTYQLFKHHLVALMVTGAI SVN ALAKDSFLENPSANLPQQVFKNRVDIFNNETNINENKKDIAINKANIASIEKDVMRNTGGIDRLAK
QELVNRARITKNELDIRKNTKSIAENTASIARIDGNLEGVNRLQNVDRSTENAARSRANEQKIAENKKAIENKADKADVEKNRADI
AANSRAIATFRSSSQNIAALTTKVDRNTARIDRLDSRVNELDKEVKNGLASQAALSGLFQPYNVGSLNLSAVGGYKSKTALAVGSGY
RFNQNVAAKAGVAVSTNGGSATYNVGLNFEW

SEQ ID NO: 5 (*Haemophilus somnus*)

MKKVQFFKYSSLALALGLGVASALAAPTSTTTGPEAPPTGPAPTAKDPLAETALAYDLENEVAYLRMKAGEWMQLGLDPEKEVIK
GWNEVKSLPRIDNGKDKQTKDQIAMLIRTVDNTKELGRIVSTNIEDIKNLKKELYGFVEDVNESEARNISRIDENEKDIKNLKELY
DFVEDVNESEARNISRIDENEKDINTLKELMDEDLNSVLTQIEDVKLTQFDVNDNVNLAFEEINGNAQKFDTAIEGLTSGLSDLQAKV
DANKQETEDDIADNAKAIHSNTKGIAKNTKDIRDLDTKQMLENDKNLMTGLESLATETSKGFERFDVKTQQLDQAVANVVGRVDIT
EQAIRQNTAGLVNVNKRVDTLDKNTKAGIASAVALGMLPQSTAPGKSLVSLGVGHHRGQSATAIGVSSMSSNGKVVKGMSYDTQRH
ATFGGSVGFFN

SEQ ID NO: 6 (Haemophilus ducreyi)

MKIKCLVAVVGLACSTITTMAQQPPKFAGVSSLYSYEYDYGKGKWTWSNEGGFDIKVPGIKMKPKEWISKQATYLELQHYMPYTPVLV
TSAPDVSPSSISILLYPMSPDQLGINRQQLKLNLYSFNDLRHDFKLKVLDARISKNKQNIDTISKYLLELGYLDGSYRMMEQNTH
NINKNTHNINKNTHNINKLSKELQTGLANQSALSMLVQPNGVGKTSVSAAVGGYRDKTALAIVGGSRITDRFTAKAGVAFNTYNGGMS
YGASVGYEF

SEQ ID NO: 7 (EPEC)

MKTVNVALLALIISATSSPFVLAGDTIEAAATELSAINSGMSQSEIEQKITRFLERTDNSPAAYTYLTEHHYIPSETPDTQTTPVQT
DPDAGQKTVAAATGDVQTTARYQSMINARQSTVTDAQQTQITEQQAQIVATQKTLAATGDTQNTAHYQEMINARLAAQNEANQRTTTEQ
GQKMNALTTDVAAQQQKERAQYDKQMQLAQKSVQAHEQIESLRQDSAQTQQQLTNTQKRVADNSQQINTLNNHFSSLKNEVEDNRKE
ANAGTASAIAIASQPOVKTGDLMMVSAGACTFNGESAVSVGTSFAGTHTVLKAGISADTOSDFGAGVGVGYSE

SEQ ID NO: 8 (EAEC)

MKTVKLSLLAVVVATAVSPSAFAGDTVEAATTELTVIQPGMSQSEIDQKIGRFLERTGNSVAAQNYLIAHDYQTTTPQENTAASPVQP
TNTLNPITNQAQTDRDNGQDTAIQDAQHAANWASLKADDAQHAI TVAQT DIDANTAAITDTRNDVSAVQSDVTNIKGDV
AHQAQSTADHANANANTALINGVKLSGAVTENKNNIEQNRSDIADQQKLLASNEQKQIVRDNGQDTAIQDAQHAANWASLKADDAQHAI
TVAQTDIDA NKAAITDIRNDVSAVQSDVTNIKGDV
AHQAQSTADHANANANTALINGVKLSGAVTENKNNIEQNRSDIADQQKLLASNEQKQIVRDNGQDTAIQDAQHAANWASMKADDAQHAI
TVAQTDIDANKAAIADTRNDVSAVQSDVTNIKGDV
AHQAQSTADHANANANTALINGVKLSGA
V
TENKNNIEQNRSDIADQQQLDETRKIV
AATGDVQTAARYQSMIDARQTA
AAANAQQAQADTQQQMDDQQKQIDATQKTV
SALGDAQ
TNAHYQEMVNAGLRAQNDANARTAAE
QKQKIDTLATNQATQQHINSVQYGEQI
QRLAQDSTQTHEQIDSLTQDVTQ
THQQLSNTQKRV
ADNSQQITTLLNNHFSSLKNEVED
NRKEANAGTASAIAIASQPQVKAGDF
MMSAGAGTFNGESAVSVGT
SFNAGTHTVIKAGVSADTQS
DFGAGVGVGYSF

SEQ ID NO: 9 (EAEC)

SEQ ID NO: 10 (UPEC)

MNKIFKVIWNPATGSYTVASETAKSRGKKSGRSKLLISALVAGGLSSFGASADNYTGQPTDYGDGWVAIGKGAKANTFMNTS
GASTALGYDAIAEGEYSSAIGSKTLATGGASMAFGVSAKAMGDRSVALGASSVANGDRSMAFGRYAKTNGFTSLAIGDSSLADGEKTI
ALGNTAKAYEIMSIALGDNANASKEYAMALGASSKAGGADSLAFGRKSTANSTGSLAIGADSSSNDNAIAIGNKTQALGVNSMALGN
ASQASGESSIONALGNTSEASEQNAIALGQGSIAKVNLSIALGSNSLSSGENAIALGEGSAAGGSNSLAFGSQSRANGNDSVAIGVGAAA
ATDNSVAIGAGSTTDASNTSVGNSATKRKIVNMAAGAISNTSTDAINGSQLYTISDSVAKRLGGGATVGSDGTVTAVSYALRSGTYN
NVGDALSGIDNNTLQWNKTAGAFSANHGANATNKITNVAKGTVSATSTDVVNGSQLYDLQDALLWNGTAFSAAHGTEATSKITNVTA
GNLTAGSTDADVNGSQLKTTNDNVTTNTNIATNTTNITNLDAVNGLGDDSSLWNKAAGAFSAAHGTEATSKITNVTAGNLTAGSTD
VNGSQLKTTNDNVTTNTNIATNTNITNLDAVNGLGDDSSLWNKTAGAFSAAHGTDATSKITNVKAGDLTAGSTDADVNGSQLKTTN
DNVTTNTNIATNTNITNLDAVNGLGDDSSLWNKTAGAFSAAHGTDATSKITNVKAGDLTAGSTDADVNGSQLKTTNDNVSTNTNI
TNLTDAVNGLGDDSSLWNKTAGAFSAAHGTDATSKITNVKAGDLTAGSTDADVNGSQLKTTNDNVSTNTNI TNLTDSVGDLKDDSSLW
NKAAGAFSAAHGTEATSKITNLLAGKISSNSTDAINGSQLYGVADSFSTSYLGGGADISDTGVLSGPTYTIGGTDYTNVGDALAAINTS
FSTSLGDALLWDATAGKFSAKHGINNAPSVIDVANGAVSSTSSDAINGSQLYGVSDYIADALGGNAVNTDGSITTPTYAIAGGSYN
NVGDALEAIDTTLDDALLWDTTANGNGAFSAAHGKDVTASVITNVANGAVSATSNDAINGSQLYSTNKYIADALGGDAEVNADGTIT
APTYTIANTDYNNGEALDALDNNAIWLDEDAGAYNASHDGNASKITNVAAAGDLSTTSTDADVNGSQLNATNILVTQNSQMINQLAGNT
SETYIEENGAGINYVRTNDSGLAFNDASASGIGATAVGYNAVASHASSVAIGQDSISEVDTGIALGSSSVSSRVIVKGTRNTSVSEEG
VVIGYDTTDGELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNAIGAVATTPTKYYHANSTAEDSLAVGEDSLAMGAKTIVNGN
AGIGIGLNTLVLADAINGIAIGSNARAHDSIAMGNGSQTRGAQTNYTAYNMDAPQNSVGEFSVGSEDGQRQITNVAAAGSADDAV
NVGQLKVTDAQVSQNTQSITNLNTQVTNLDTRVTNIENGIGDIVTTGSTKYFKTNTDGADANAQGKDSVAIGSGSIAAADNSVALGTG
SVADEENTISVGSSTNQRRITNVAAAGVNATDAVNVSQQLKSSEAGGVRYDTKADGSIDYSNITLGGGNSGTTRISNVSAGVNNDAVNY
AQLQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMVSANGRWVYKLOG
STNSQGEYSAALGAGIOW

SEQ ID NO: 11 (*Shigella flexneri*)

MTNLGEDALKWDKDNGVFTAHTETTSKITNVKGDLTTGSTDVNSQLKTNDAVATNTNIATNTNISNLTEVTNLGEDALKWDKDNGVFTAHTGNNTASKITNILDGTVTATSSDAINGSQLYDLSSNIATYFGGNASVNTDGVFTGPTYKIGETNYYNVGDALAAINSFSTSLGDALLWDATAGKFSAKHGTNGDASVITDVADEIISDSSDAVNGSQLHGVSYVVDALGGGAEVNADGTITAPTYTIANADYDNVGDALNAIDTPDDALLWDADAGENGAFSAAHGKDKTASVITNVANGAISAASSDAINGSQLYTTNKYIADALGDAEVNADGTITAPTYTIANAEYNVGDALDALDDNALLWDKTANGGAGAYNASHDGKASIITNVANGSISEDSTDVNSQLNATNMMEQNTQIINQLAGNTDATYIEENGAGINYVRTNDNDLAFNDASASGVGATAVGYNAGASSVAIGQNSSTVDTGIALGSSVSSRVIAKGSRDTSTVTENGVVIIGYDTTDGELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNAIGAVATTPTKYFCHANSTAEDSLAVGEDSLAMGAKTVVNGNAGIGIGLNTLVLADAINGIAIGSNARANHANSIAMGNGSQTRGAQTYTAYNMDAPQNSVGEFSVGSEDGQRQITNVAAGSADTDAVNQQLKVTDERVAQNTQSITNLNNQVTNLDTRVTNIENGIGDIVTGSKYFKTNTDGVDANAQGKDSVAIGSGSIAADNSVALGTGSVAEEENTISVGSTNQRRITNVAASVNATDAVNVSQQLKSSEAGGVRYDTKADGSIDYSNITLGGNGSTTRISNVSAGVNNNDAVNYAQLKQSAQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMASIGGGTYNGESAVALGVSMVSANGRWYKLQGSTNSQGEYSAALGAGIQW

SEQ ID NO: 12 (*Brucella melitensis*)

MSFFKKNISITAMGGLMSLAVDAAKAEENVSQVKLPPVFELVENQGLANIALIRPRVIAPDNNLRPGGIVSGIAGLLTLQENRN
LISENRQVINNNTTAIGQNRSTSITNAKGVADNRAAIRQNSAAISALGQRVDSLQGQINSARKEARAGAANAAALSGLRYDNRPGKVISATGVGGFKGSTALAGIGYTSKNENARYNVSVAYNEAGTSWNAGASFTLN

SEQ ID NO: 13 (*Brucella suis*)

MSFFKKNISITAMGGLMSLAVDAAKAEENVSQVKLPPVFELVENQGLANIALIRPRVIAPDNNLRPGGIVSGIAGLLTLQENRN
LISENRQVINNNTTAIGQNSDRIDANAKGVADNRAAIRQNSAAISALGQRVDSLQGQINSARKEARAGAANAAALSGLRYDNRPGKVISATGVGGFKGSTALAGIGYTSKNENARYNVSVAYNEAGTSWNAGASFTLN

SEQ ID NO: 14 (*Ralstonia solanacearum*)

MVFSAMPQYACAEMLLQNPDGTNCGSVGDAYAWARGDGYSGCKVGYEAAKNLAKGTAFGNSLGQLSPGTNILVYGSTLRAGMNEVTP
LDSMNIGGHLDVGASGFHGGVDMNNSAIKNLADTLSATSTEAVTGRQLNATNTNITNLQNSIKSISSSASLQQSAAGKDTITVAKD
LDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGKQLYTTNQNLSTTNQNLADTNKSLAETNKNVSATTNITNLQNTIKN
ISGGSAGLVQQSAAGKDTITVAKDLDGEAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGKQLYTTNQNLADTNKSLAETNKNVSATTNITNLQNTIKN
TTAEGNLSSNTTSITNLQNTIKNISGGSAGLVQQSAAGKDTITVAKDLDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGR
QLYTTNQNLSTTNQNLADTNKSLAETNKNVSATTNITNLQNTVNNIISGSAGLVQQSAAGKDTITVAKDLDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGR
SRKLTGVAEGTLSATSTDVSGKQLYTTNQNLSTTNQNLADTNKSLAETNKNVSATTNITNLQNTVNNIISGSAGLVQQSAAGKDTITVAKDLDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGR
VAKNLDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGKQLYTTNQNLADTNKSLAETNKNVSATTNITNLQNTVNNIISGSAGLVQQSAAGKDTITVAKDLDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGR
TIKNISGGSAGLVQQSAAGKDTITVAKDLDGDAVDFSGKNLSDSTTFSRKLTGVAEGTLSATSTDVSGKQLYTTNQNLSTTNQNLADTNKSLAETNKNVSATTNITNLQNTVNNIISGSAGLVQQSAAGKDTITVAKDLDGDAVDFSGKKLSDSTTFSRKLTGVAEGTLSATSTDVSGR
VSGKQLYATNQNVSKLSANVTDVSDSVTNIKNTMNTIVNGGLKYFCHANSTLDDAQAMGLESIAFGGAAVAAGMNSMAMGGNARAVAG
NAVALGAGSVADRANTVSVGSAGKERQITNVAAGTADTDAVNVAQLKAAGIINGSRTNATVYGTNADGSADYGNVTLGGGNAPAGT
AIHNVAAGTAETDAVNVRQMNAIASVQKVSNTNDPMFAADGDRAVKRASAKGTHATAMGAAASAGGDQSATGHNAQSGGDSSVAMG
ANAKATANHAVAVGSGSVANRANTMSVGSAGSERQITNVAAGVQGTDAVNVSQLSQAVYAAVGDLPAGTTARQYTDEQIGMVRQGISQ
VARGAYSGIAAATALTMIPDVGKSLAIGIGSATYKGYQAVALGASARISHNLKAKMGVGSSEGTTVGMGASYQW

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SEQ ID NO: 15 (*Sinorhizobium meliloti*)

MALGRQSVSAGSGSLAFGNGSYANSNGSVAIGQSYAANVRAIAIGGDDAFWREAEQTKAGGSQSIAMGVRARTKSLVVDDPDTVAN
EADPGGASDAIAIGTDAQANGDRSLAIGRQNQAGNEQSIGIGAGNTATGKLSIGIGSSNVASGEQSLSLGAGNNALGQGSISIGTETT
AGGLRSIAFGVRASTKEANLDIPDDVAAIDAIAIGTNTKANGDRSVSIGTGSQASSGAVSIGDAAKAVGDKSVSIGTESWADGDESVS
IGLVNNAGFEGNDRIKGQGQTSVSLGAFNQSPGIEAIAIGARNEANADRSIAIGSRAKTKAADPAQADGGARDAVAIGTDALANDRSI
SIGWNSSTSLNDISIGTRATSGSAGDIMIGTGSQGSTSGQNNVALGVAASQVKKGSSNIAIGDSAGGSREGDNNAIGTNAGIQFS
ESEHETAVRADLVVSDAVSIGNEALASADEAIAIGTGAVASGLKSIISIGVGNLTVSGASSGAIGDPTDITGTGSYSLGNDNTIAADNAG
TGFNDNTLADAADGSRVIGNGNNIDVSDAFVLNGADVTEVGGVALGGSVSDTGADVAGYVPGGASTADQNAIEATQSTRGAVAVGN
PDAETGVYRQITGVAAGTADSAAVANVAQLKSVETIAKTGWKLTDGSSIDGIGPGDELVLKGGDGNIVISNQILSNDVSIDLADIEV
NRVTARDPDTGASTVLDENGLSFTTQDANGEDTALGPRVTAAGIQAAGKITNVAAGEADTDVNFSQLRQVETASGNTDQRAVKYDWT
DANTNGVIDEGELNLDSTVLAGGMGGTRISNLAPGALSAASTDAVNSQLFGLRSRVSNVALGGAAYDPVKDEWIAPKYTIGGTD
YSNVDALAAVGGTAGAGWLSAQGANASNVAPGETVDLRSGDGNIVVSKAETGDTVSFDLADDLVSSESITVGADPADPNAPTTVIT
GGSIVIGSTMLGSNGLVITGGPSVTTDGIAGGMKVTNVANGTVAKDSKDAVNNGQLFDVVAATANGVGYDDKSKGTLTLEGANGTK
ITNVAAGDLNANSTDVNSQLYATNVKVDRLTEVKEIDSRVTVIESFQGDLENAAVYDTDAAGKRLNLTLEGDPDKPVLIANVA
KGVKATDAVNQVQLDESVAESKSYTDEKTEWAIDQAAIYTDQVIETKVSAVNNYAQQRFAQLSGEIGQVRSEARQAAIGLAAASLRF
DNEPGKLSVALGGFWRSEGALAFGAGYTSEDGRVRANLTGAAAGGNVGVGAGLSITLN

SEQ ID NO: 16 (*Bradorhizobium japonicum*)

MRAFGSGNAINGTNYAAVGSNNVAGNNGAVVGSNGVTGDNTAAGSSIGIAGGNAAVGSFSTVTGSNSAAVGSFNNSGNNSGAF
 GTGQNIRGNGTFAIGDPNIVNGNNLVFGDNNTVNGSNVAGRGNQIQLVGSNNTIAATSSAAGSSVFGSGNTVNATNAVVMGNNSTVS
 GASSVAIGNGTAVTGINAIAMGTGAGANFDNSVAIGSGATTTRANQAVGTASSTYMSGITSAASKAAQSGPTQLVTSDAAGNLATT
 SLAGLGLASAGDINGINSQALALNGRVDNLTRESRGVALALAASSLQFDPRPGKISVSGFGNFQGQSGLAVGLGYSYSDAMRFNAA
 FTAAQQGAIGVLAGASWTLN

SEQ ID NO: 17 (*Burkholderia fungorum*)

MNKTYSVWNESTGTWVAASEHASARGKKSSAKTSSTKAVVGALGLAAGLYGADAFALGGGLTLCPTTEGSAGYTAGSASSANGAYCG
 SDYQWGLFSNTNADGSKSGQPIGAAIEGMNDGSLLYGPNNIVMKNLVSMSNNKIINLAPGTVSTSADAVNGSQLYATNQNVSNIGN
 TVNNITTGAGIMYFHNSTLADSTANGVNSIAIGGATRTDANNSISIGTGLTQASSNTGAIAGQNASINVYGANSIAIGTNSATGGI
 GGAIALGENAFATGGKMLALGSGASATTANSVALSGSGSTTANLTAAGYNPGSGTLAGTSQATNGEVSGVAGERRITNVAAGSAAT
 DAVNVSQLOQSEDAKVNTINNNVNNLSGSVTNISSTVNNITNGGGIKYFHNSTQADSSATGTDAVAIGGNAQATAANSVALGLNSTSK
 GTNAIALGGAVAGGSYAFAGSLALAATTGDIALGSSATASSANSNAYATALGTNALANATDATAIGEGASATAASSVALGARSKT
 NLSTAGYNPGTGLSGTTPTGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLOMSEDAKVNTINNNVNNLSNNVTNIAGNVTNISNTVN
 NITNGGGIKYFHNSTLADSSAGGTNSIAIGGATTGNVTAGTSNISIGTNATTNYGKNAIGGNAQALGGAYDGGYNTAIGENAI
 KGDGAGGFGGGGWQTTAIGGSQALHDNTTAVGSGAIANVANATALGMSASATGSAIALGQGAVASAANSVALSGSGSTTXNLSAA
 GYNPGTGLSGIASVANGEVSVGAAGKERRITNVAAGSAATDAVNVSQLOQSEDAKVNTINNNVNNLSGSVTNISNTVNNITNGGGIKY
 FHTKSTLADSSATGTDAVAIGGNAQATAANSVALGSNTTANLSAAGYNPGTGLSGIASAANGEVSVGAAGKERRITNVAAGSAAT
 DAVNVSQLOQSEDAKVNTISNNVNNLSGSVTNISSTVNNITNGGGIKYFHTNSTLADSTANGVNSIAIGGATRTDANNSISIGTGLTQA
 SSNTGAIAGQNASINVYGANSIAIGTNSATGGIGGAIALGENAFATGGKMLALGSGASATTANSVALSGSGSTTANLTAAGYNPGSG
 TLAGTSQATNGEVSGVAGERRITNVAAGSAATDAVNVSQLOQSEDAKVNTINNNVNNLSNNVTNIAGNVTNISNTVNNITNGGGIKY
 FHTKSTLADSSATGTDAVAIGGNAQATAANSVALGSNTTANLSAAGYNPGTGLSGTTPTGEVSVGSAGKERRVTNVAAGSAATDA
 VNVSQLQSAIIGSTANAVAYDDGTATVTLKGASGKITNLTAGNLSATSTDVNSQLYATNQNVSNIGNTVNNITNGGGIKYFHN
 STQADSSATGSNSVAVGDRASSLGSSVAMGDGATAVGAASIAIGNNAQNVTSNNSVAIGGDSKAGDRSVLNGADTSLSWGVAV
 GTNANVSAALGTAIGAGANVSGANSTAIGANAVASATNSVALGSNTTANLSAAGYNPGTGLSGIASAANGEVSVGAAGKERRVTN
 VAAGSAATDAVNVSQLOQSEDAKVNTINNNVNNLSGSVTNISSTVNNITNGGGIKYFHTNSTLADSSAGGANSIAIGGAAATSSAGLS
 DNMAIGTNATASYGKNAIGGQAQATGGTYDGGYNVALGENANATAGTNAWGHNTAIGANTVINGVNSVALGISATTSGSGMAFGSA
 AQASADYAIASGAGANASAVNSVALGSNTTANLSAAGYNPGTGLSGIASVANGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLO
 SEDAKVNTINNNVNNLSNNVSNIAGNVTNISNTVNNITNGGGIKYFHNSTLADSSATGTDAVAIGGNAQATAANSVALGSNTTA
 NLSAAGYNPGTGLSGTTPVGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLOQSAIIGSTANAVAYDDGTATVTLKGASGKITNL
 AGNLSATSTDVNSQLYATNQNVSNVGNVSNLSNNVTNIAGNVTNISNTVNNITNGGGIKYFHNSTLADSSATGTDAVAIGGNAQ
 ATAANSVALGSNTTANLSAAGYNPGTGLSATTGVGEVSVGSAGKERRVTNVAAGSAATDAVNVSQLOMSEDAKVNTINNNVNNLSN
 NVSNIAGNVTNISNTVNNITNGGGIKYFHNSTLADSSATGVDAVAIGGNAQATAANSVALGSNTTANLSAAGYNPGTGLSGIA
 SAANGEVSVGAAGKERRITNVAAGSAATDAVNVSQLOQSEDAKVNTINNNVNNLSNNVSNIAGNVTNISNTVNNITNGGGIKYFHN
 STLADSSATGTDAVAIGGNAQATAANSVALGSNTTANLSAAGYNPGSAAALSGTASAANGEVSVGAAGKERRITNVAAGSAATDAVN
 SQLQSEDAKVNAEGAATAALGGGTYNTTGAITSPTYIAGGKTFNNVGDVVTNIDGRVTQNSTDITNLTTIDNGTIGLVQQATPT
 STITVAKDTGGATVDFRGTGNATRTLTGITAGELSATSTDVNSQLYATNQNVSNIDNTVSNLSNNVTNIAGNVTNISNTVNNITNG
 GGGIKYFHNSTLADSSATGVDAVAIGGNAQATAANSVALGSNTTANLSAAGYNPGTGLSGIASAANGEVSVGAAGKERRVTNVA
 AGSAATDAVNVSQLOQSEDAKVNTINNNVNNLSNNVSNIAGNVTNISNTVNNITNGGGIKYFHNSTLADSSATGTSNLAAGPAAVAS
 ATDAVALGNGAKATNAGAVALGAGSTTAVATSGTTIGGITYTFAGVAPSSTVSGAAGSERTITNVAAGRLSATSTDVNSELFA
 TNQQVTRNTADITNLTNMMNIGSVGLVQQDATRTITVAKATDGTRVDFGTGGARQLTGVAAAGAVNATSVDAVNGSQLYGVSQLV
 AIGGGSTVNTDGSISAPTYVVDGTVHNAGDAISNLDRVTQNTTDISTINNTLNSITTGAGVKYVHNSTLADSLAKGAESVAIGGN
 AQSGAANSVALGSNSVADRANTSVGAAGAERQITNVAAGTADTDVNVAQLKASGVINTDGTNAAVTYDHNADGSANYNSVTMNG
 VAGGTTIHNVAGSAADDAVNVSQMNAIISVSNIIGSAGNPLFTADGNRDTEAAVASGTHATAMGANAKASAANSVALGANSVADRE
 NTVSVGSAGNERQVTNVAAGTATTDANVGQLNQAIGASIGNLPAGMSAKDYTDQQINAQNGVNQVAKNAYAGIAAATLTMIPDVD
 QGKTIAVGGGGSYKGSQAVALGISARITQNLKMKAGAGTSSQGTTVGLGASYQW

SEQ ID NO: 18 (EPEC)

MLIQQNSEVINQLAGNTSETYIEENGASINYVRTNDTGLFTDASAAGIGSTAVGYNTVAKGDNSVAMGYNFAEGHSSVAIGQGSYS
 GVETSIALGSESVSSRVIVKGSRNTSVSEGVVIGYDTTDGEELLGALSIGDDGKYRQIINVADGSEAHDAVTVRQLQNAIGAVATTPT
 KYYHANSTAEDSLAVGEDSLAMGAKTIVNGNAGIGIGILNTLVLADAINGIAIGSNARAHADSIAMGNGSQTRGAQTNYTAYNMDAP
 QNSVGEFVGSEDGQRQITNVAAGSADTDNVGQLKVTDAQVSQNTQSITNLNTQVTNLDRVTNIENGIGDIVTGSTKYFKTNTD
 GVDANAQGKDSVAIGSGSIAADNSVALGTGSVANEENTISVGSSTNQRRITNVAAGVNATDAVNVSQLOKSEAGGVRYDTKADGSID
 YSNITLGGNGGTTRISNVAGVNNNDAVNYAQLKQSVQETKQYTDQRMVEMDNKLSKTESKLSGGIASAMAMTGLPQAYTPGASMAS
 IGGGTYNGESAVALGVSMVSANGRWVYKLQGSTNSQGEYSAALGAGIOW

SEQ ID NO: 19

GSGGGG

SEQ ID NO: 20 (*Haemophilus aegyptius*)

GTACCGCACGAGCTGGAAAAAGGCACGGCAGTCTTTGTCGAAGCCATGATTACAAGTGCTAGGTAAAATCAAACGTTATAC
 TGAGGAAATTTAAAGGCACGCATTAGCAGGTTAGAACCTCGCACTAACGCCAAAAGATGGCGAAGTGAATCTGTCAGCAA
 AAACAAAAGGCGCGCATTAAAGAAAAACGTGAAGATAAGAAAAACAGAGGCAAAGAAAAAGTAAAATTGCGTCATAAGGATACAA
 AAAATATCGGCAAACGACGCAAGCCAAGTAATAGTAATATTAAATTAGGTATGATGAAATTCTGCTTGAGGCAAATTACATAGGA
 AATTTTCTATATTGCTTAACGTTTTATAGTAGAAGTATATACTCAGTTATGGTTATGGTTACATAGTATAGTTTACTTTGTT
 CTAGTTCACTTTAACCTTAAATAATTGAGGATTCTTATGAAAAGAAATTATTAAAACAATCTGTAATCGCTGTGTTGATAGGT
 GGCACACTGTTCTAATTATGCTTAGCACAAGCACAAGCACAAGTCAAAAAGATGAACCTAGTAGTGAGTTAAAGAAACAAG
 TAAAGGAAATGGATGCTGCTATCGATGGTATTCTGATGATAATATTGCTTATGAAGCTGAAGTTGATGCAAAACTGATCAGCATT
 TGCTGCTCTGGTAGACATACAAATAGACTCAATACTTAAACGATTGCAGAGAAAGCAAAGGTGATTCAAGTGAAGCAGCTGAT
 AAAATTGAAGCTCTGAAGAACAAAATGATGAGTTTAGCGGATATTACAGCTTAGAAGAGGGAGTTGATGGTTAGATGATGATA
 TCGCAGGTATTCAAGATAATATTCTGATAGAAGTGAATTAATCAAAATTCTGAGACATCGCAACTAACACAGCGGCAATCGC
 AACTCACACTCAACGTCTGATAATTAGATAACAGAGTAAATAACCTTAATAAGATCTTAAACGTGGCTTGCTCAAGCTGCA
 TTAAATGGTTATTCCAACCGTATAACGTAGGTAAATTAAATCTACTGCTGTAGGTGGTTATAAATCTCAAACACTGCAGTTGCTG
 TAGGTAC

SEQ ID NO: 21 (*Haemophilus somnis*)

ATGAAAAAAAGTACAATTTTAAATATTCACTATTGGCATTAGCATTGGTTAGGGTAAGTGCTCTGCTTGGCAGCCCCAACAA
 GTACAAGTACGACTACTGGACCAGAGGCGCCTCCTACAGGCCCTGCTCCTACGGCGAAAGACCCCTAGCAGAACAGCGTTAGCCTA
 TGATTTGGAGAACGAAGTGCCTATCTCGTATGAAGGCGGGTAGTGGATGCAATTGGGCTTGATCCTGAAAAAGAAGTCATCAA
 GGCTGGAATGAGGTAAAATCTCTCCCTCGTATCGATGGAATGGAAAGGATAAACAGACAAAAGATCAAATAGCAATGTTGATAAGAA
 CGGTTGATAATACAAAAGAGCTGGTCGGATCGTTAGTACAAACATTGAAGATATTAAGAACCTTAAAAAGAGCTTACGGTTTGT
 AGAAGATGTGAACGAGAGTGAAGCACGCAATATCTCAAGAATAGATGAGAATGAGAAAGATATTAAGAACCTTAAAAAGAGCTTAC
 GATTTGTTAGAAGATGTGAACGAGAGTGAAGCACGCAATATCTCAAGAATAGATGAAAATGAGAAGGACATTAATACTCTTAAAGAGC
 TAATGGATGAGGATTAAATTCACTCTAACCCAAATTGAAGATGTAAAACATTCAGATGTCAATGATAACGTTAATTGGC
 ATTTGAAGAGATTAATGAAATGCCAAAAGTTGACACTGCTATTGAAGGACTTACTCAGGTTGAGCGATTACAAGCTAAAGTC
 GATGCAAATAACAAGAAACTGAAGACGATATTGCGGACAATGCCAAGGCTATTCAAGAACACAAAAGGTATTGCTAAAAATCCA
 AGGATATTGACTTGGACACCAAAACCAAGCAAATGTTGAAAATGACAAAAACTGATGACCGGTTAGAATCTTAGCAACAGA
 AACAAAGCAAAGGCTTGAAAGATTGATGTCAAACACAATTAGATCAAGCGTCGCAAATGTCGCGGTGAGTAGACATAACT
 GAGCAAGCTATTGCCAAAACACTGCAGGCTTAGTCATGTGAATAACGTGTCGATACACTCGACAAAACACCAAAGCCGGTATCG
 CTTCTGAGTCGCTTAGGTATGTCGCAATCCACTGCTCCGGTAAATCATTAGTGAGCTTAGGTGTCGCGTCATCACCCTGGCA
 AAGTGCTACTGCTATTGGAGTATCTCTATGAGCAGTAACGGTAAATGGTTGTTAAAGGCGGTATGAGCTATGATAACACAGCGTCAT
 GCTACTTCGGCGGTTCTGTCGGTTTTCTTAACTAA

SEQ ID NO: 22 (*Escherichia coli*)

ATGAAAACGTAAACGTAGCTTACTGGCACTCATAATTCAAGCAACATCCAGGCCCTGTTAGCTGGTGTACATTGAAGCGG
 CGGCAACAGAGCTTCAGCCATTAACTCTGGCATGTCGAATCGGAGATTGAGCAGAAGATTACCGCTTTAGAACGCACAGACAA
 CAGCCCCGCTGCGTACACTATTGACTGAACATCACTACATCCCTCTGAAACACCTGATACCAACTCAGACTCCACTGTCCAGACA
 GATCCTGACGCAGGACAAAAACCGTTGCCGTACAGGTGATGTACAGACAACCTGCCGTTATCAGAGCATGATCAACGCCGACAGT
 CTGCGGTAACTGACGCCAGCAAACGCAAATTACAGAGCAACAGGCGCAGATCGTAGCCACACAAAAACGCTGCCGACTGGAGA
 TACGAAAATACCGCGCATTACAGGAAATGATTAATGCCAGACTGGCGCTAAAATGAGGCTAATCAGCGCACGCCACTGAACAA
 GGGCAGAAAATGAATGCGCTGACAACCGATGTGGCAGTACAACAGCAAATGAAAGGACTCAATACGATAAAACAAATGCAAAGTCTGG
 CGCAGGAGTCTGCCAGGCACATGAACAAATTGACAGCCTGTCACAAGACGTAACCCAAACGCACCAACAGTTAACCAACACCCAAA
 ACGGGTTGCAGATAACAGCCAGCAAATTAAACACGCTCAATAACCATTGACTTCAGTCGCTAAAAACGAAGTTGATGACAATCGTAAAGAA
 GCCAATGCGGGAACTGCATCTGCCATCGCTATGCCCTCACACCACAGGTTAAACCGGTGACGTGATGGTGTAGCAGCGGGAGCGG
 GAACCTCAACGGTGAATCTGCGGTGTCGGAACATCATTAAATGCCGGAACGCATACGGTACTTAAAGCCGGTATTCTGCGGA
 TACACAAATCTGATTTCGGCGCAGGTGTCGGCGTGGGATATTGTTCTAA

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SEQ ID NO: 23 (*Escherichia coli*)

ATCGCCAAACAGCGTCGGCGTAGTAAGAGACTTGCTGACGGTAGATTCTGGCTTAGTGTGCTGACATCCTCACCTCA
 AACAGTAACGTTCCGCTGGTGGCTGATCAATGAAGCAACTATTTCAGCGTACTTTGCCACAAACCAGAAGGACCGGTAATTA
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 CAAAGGACTATTCTGCTCGTGTCCCTTTCTGATTTACTAAAAACAGTTATCCTCGCAGGAATAAGGGGGAACTCTC
 TTTCAGTAATCAGGTATAATTGTTAATCAAGCAGCAATTGCTGATTGGACGGTACAACAGGAGGTTTCCGATGCTTATCT
 TTATCCGATTCTCATTGTCGGCTGGTCAATTGTCGGCGGGCGTAAAATCGTGCAGGGCTATCAATGGACGGTAGAACG

TTTGGTCGCTATACAAAACGTTACAGCCGGGCTCAGTCTGGTGGCGTTATGGATCGCATTGGTCGCAAGATCAATATGATG
 GAGCAAGTGCTCGATATCCCTCCAGGAAGTTATCTGAAAGATAACGCCAACGTTACCATCGACGCAGTCTGTTTATTCAAGGTGA
 TTGACGCGCCACCGCGGCTTATGAAGTCAGCAATCTGGAGCTGGCGATCATCAACCTGACCATGACTAACATCCGTACCGTGGTGG
 TTCAATGGAACCTGACGAAATGCTCTCAGCGCAGACAGCATCAACTCACGCCTGCTGCGTATTGTCGATGAGGCCACCAACCGTGG
 GGGATTAAAGTCACCGTATTGAAATTGCGACGTGCGCCCACCGCAGAGCTATCTTCAATGAACGCGCAGATGAAAGCGGAAC
 GTACCAAACGCGCTTACATTCTGAAGCGGAAGGGATCCGTAGGCGGAAATCCTCAAAGCGAAGGTGAAAACAGTCGCAAATCCT
 GAAAGCGGAAGGCGAACGTCAGTCGGCTTTACAGGCTGAAGCGCGTGAACGTTCCGCTGAAGCAGAAGCCGCCACCAAAATG
 GTGTCAGGCAAGCCATCGCCTCCGGTATATTCAAGGCGGTGAACACTTCGTAGGCCAGAACATACACCGAAGCGTTACAGCAGATCGGTT
 CCTCCAGTAACAGCAAAGTAGTGATGCCATTAGAGGCCAGCAGCCTGATGGGTCGATTGCCGGATTGCCAGCTGGTGAAGA
 CAGCGCCAACAAAGCGACTCAGCCATGATGGAGTTAATAGTCGTTACCCACATATTCTGGCTCAGTCAGTCGGCTTGCTGCTGG
 CAGCCGAGATGCTGGCGGAAATGGTTATTGTTGAGTGGCTGGCGAGCAGTGATTACTGGCCTGGTGGCTGGCTGGTGGCGCT
 GGGTTGGGAGTGGCAAGGGGTGATGTTGCCCTGACGCTGCTGCCGCGCTGGCTGGTGGAAATGGTTGTCGCCGGGGTGC
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 CGTAGGCCGCTCCGCCATGTTAAATGTTAACTGGCATTGGCAATTACTCTCCGCCCTTACTCATACTTTTGGTCTTCATCC
 GGATAGTGTGTTTTAGATATTCAAGGACGTTTATTGACCTGTTGCGTATACACCCACCCCTTCAGTAATCAGGCTGGTCCA
 GGTAAACTCTGGCGGAATGGTAAATCAGAAAGCGTTACCCATTGCTAACAGATCGGGTTCTGTTCTGATCAACTGCAACAG
 CATAATCAGCGACATGGCAGAGGCAGGAGCCGTACTATGCCGCTAAATACTTCCACACTGTCGACCGGTTGAAACGAAAAGGATC
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 AAAACAAGTCTTACTCTTTTACATTGAAAGAGCACGAAATGATTCTTTTATTATATAAGAAACCATTTTGGTCTTATT
 GATGGTGTGTTACGCTTACAACAGACAAATGCGCTTACATCACACAAATGGCGCGTAGATTGCAACGCACTGTTA
 TTTCTTAAACAAATATTGTTCTTATAGAAACATTAATACGACTTATTGAAACAAGAGAAAATGAATGAAAACGTAAACGTA
 GCTTACTGGCACTCATAATTCAAGAACATCCAGCCCTGTTAGCTGGTGTACCCATTGAAAGCGGGCACAGAGCTTCAG
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 AAAACCGTTGCCGCTACAGGTGATGTACAGACAACGACACTGCCGTTATCAGAGCATGATCAACGCCGACAGCTGCCGTA
 AGCAAAACGCAAATTACAGAGCAACAGGCCAGATCGTAGCCACACAAAAACGCTGCCGACTGGAGATACGAAAATACCGCGCA
 TTATCAGGAAATGATTAATGCCAGACTGGCGCTAAAATGAGGCTAATCAGCGCACGCCACTGAACAAAGGGCAGAAAATGAATGCG
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 TCTGCCATCGCTATGCCCTACAACCACAGGTTAAAACCGTGACGTGATGGTGTAGCGGGAGCGGGAACCTCAACGGTGAAT
 CTGCGGTGCTGCGAACATCATTAAATGCCGAAACGCTACGGTACTTAAAGCCGGTATTCTGCCGATACAAATCTGATTTGCG
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 TAATTGTCATTATTAAAGGTTAACATGATGAATAGCTCCATTAAATGTTCCCTGCTGCCGGTTATATTACTGGCTGGCTGTA
 GTTCACCCACTCCGCATCGCAGATTGCCAGGCCAGGGCGTCAGTCATGACACCTGTTACCTCGCAGAACAGCAGCGTCAGGCC
 TATTTAAGTCATCCGAGGCACAGGCATTAAAATGCAAGAAGCCGACAACACGCCAGGCCAGGAGAACCTTAAAGG
 TTTGGCATGACCTTAAAGGAGTGGAGCTAAACAGGAAATCCAGGAAGGCTTATTGACTCGCCTTAATGAAAGAAGGCCAGTTGCG
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 TTTAAAATGAAGGAGCAAGGAAAATACCCCTGACGCATATTGATTATCGGTGCGTTATTGCTTCTGCAAGTAGTATT
 TAGCCTCCCTGGTTACGCTGTGAATGTTAACAAACGAAATCCAGGAAGGCTTATTGACTCGGGCGCATTATGGTAGAAAGTTGCG
 GCATATTCTTCGGTCAAACGGGATTCACTGATTTCACCCGCCGATGATGACAGCAGCCGAGAGATTTGATAATCGGCA
 GTCGGCGCTGTCATACCGGGCAGGCATGCCAGGCCAGTAGCTGGTGCCTAGATGCAAGTCTTCGATATGCCGTTCAATC
 TCCGCCACCTCTCCAGCGTGCACGTTGACGTCGGCACTGTGACGCTGCCGGTCAACAGATTACCAAGCTGCCGCTCT
 CCAGGTTAAAGCCCACCTGGCGCCCTGGCGCAGTAAGGTCAATTGTTGAGATGCTGCGTAGGTCGATAACCATTGCG
 GCGCATCGCGCGTCACCAGCCCTCTTCAAGAAGCGAATGGCTTGTGGTCAGGCCGGTAATTGCTACATCGCTAATG
 TTCATCGTCGCGCAACGCC

SEQ ID NO: 24 (EPEC)

ATGAAAACGTAAACGTTAGCTTACTGGCACTCATAATTCAAGAACATCCAGCCCTTTGTTAGCTGGTGTACCAATTGAAAGCGG
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 CAGCCCCGCTGCATATAACCTATTGACTGAACATCACTACATCCCTCTGAAACACCTGATACCAACTCAGACTCCCCCTGTC
 GACACA
 GATCCTGACGCAGGACAACAGGACAGGACAGGACAGGACAGGACAGGACAGGACAGGACAGGACAGGACAGGACAGGACAGG
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TACGCAAAATACCGCGCATTATCAGGAGATGATTAATGCCAGGCTGGCGGCTAAAATGAGGCTAATCAGCGCACTACCACCGAACAA
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 CGCAGAAGTCTGTCCAGGCACATGAGCAAATTGAAAGTCTGAGACAAAGATTCCGCACAAACGCAGCAACAGTTAACCAACACCCAAAA
 ACGGGTTGCAGATAACAGCCAGCAAATTAAACACGCTCAATAACCATTAGTTCGCTAAAAAACGAAGTTGAGGACAATCGTAAAGAA
 GCCAATGCCGGAACTGCATCTGCCATCGCTATGCCACAACCACAGGTGAAAACCGGTGACTTGATGATGGTCTAGCGGGAGCGG
 GAACCTTAACGGTGAATCTCGGGTGTCTCGGAACATCTTTAATGCCGGAACGCATAACGGTACTAAAGCAGGTATTCTCGGA
 TACACAATCTGATTCGGTGCAGGGTGTGGATATTCGTTCTAA

SEQ ID NO: 25 (EAEC)

ATGAAAACGTAAAGCTGTCTTACTGGCTGTCGTTGCTACCGCGTAAGTCCATCGCGTTGCGGGTGTACTGTTGAGGCGG
 CAACGACAGAATTAAACGGTAATCCAGCCAGGAATGTCGAATCGGAAATTGATCAGAAAATTGGTCAATTAGAAAGGACAGGGAA
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 CCAACTGGGCTTCACTGAAAGCTGATGACGCCAGCACGCCATCACGGTGGCGCAGACGGATATTGATGCCAATACAGGCCCATCAC
 CGATACCGTAATGATGTCGCCAGTCAGTCAGACGTACCAACATAAAAGGCATGTCGACATGCCAGTCACGGCTGACCAT
 GCCAACGCTAACGCCAACACCGCTCTGATTAACGGGTCAAACCTTCCGGTGTGACAGAAAACAAAACAACATCGAACAGAAC
 GCAGCGATATTGCTGACCAGCAGAACTGTTGGCATCAAACGAGCAAAACAGATCGTCCGCAGAACGGCAGGATACCGCCATTCA
 GGACGCACAACATGCCCAACTGGGCTTCACTGAAAGCTGATGACGCCAGCACGCCATCACGGTGGCGCAGACGGATATTGATGCC
 AATAAAGCCGCCATCAGGACATCCGTAATGATGTCGCCAGTCAGACGTACCAACATAAAAGGCATGTCGACATGCC
 AGTCAACGGCTGACCATGCCAACGCTAACGCCAACACCGCTCTGATGAAACGGGTCAAACCTCTCCTGTGACAGAAAACAAA
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 CGATGTCGACATGCCAGTCAGGCTGACCATGCCAACGCTAACGCCAACACCGCTCTGATTAACGGGTCAAACCTTCCGGTGT
 GTGACAGAAAACAAAATAATATCGAACAGAACCGCAGCGATATTGCTGACCAACAGCAACAACTCGACGAAACCCGGAAAATCGTTG
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 AGCTGACACCCAGCAGCAACAAATGGACGATCAGCAGAAACAAATCGACGCCAGCAGCAAAACGGTTCCGACTGGGATGCCAG
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 TCTGATTCGGCGCGGGTGTGGATATTCTTCTAA

SEQ ID NO: 26 (UPEC)

ATGAACAAAATTTAAAGTTATCTGGAATCCGGCAACAGGCAGTTACACCGTTGCCAGCGAACGGCGAAGAGCCGTGGAAAAAAA
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 GCCAACTGATTATGGCGATGGCTCAGCAGGTGACGCCCTGGGCTATCGGTAAAGGGCAAAGCAAATACCTTATGAACACTAGT
 GGCGCGAGTACAGCTTAGGATATGACGCCAGACGGTGAAGTACAGTTCTGCCATCGGTCAAACCCCTTGCACACTGGGAG
 CATCCATGGCGTCCGGGTTAGTGCAGGAAATGGGTGACAGAAAGTGTGCGCTAGGTGCATCGTCAGTAGCAAATGGCGATCGTTC
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GTTAACGGCTCCAGCTAAAACCACCAACGACAACGTGACGACCAACACCACCAACATGCCACTAACACCACCAATATCACCAACC
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 CGATGCTGTTAACGGTCCCAGTTAACGCAACCAATATTCTGGTACGCAAATAGCCAATGATTAACCAACGCTGCTGGTAACACT
 AGCGAAACCTACATCGAGGAAAACGGTGGGGTATTAACGACTTACGACAGCAGGCCATTAGCGTTAGCGTTAACGATGCCAGCGCTT
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 CGCGAGTTGAAGCAAAGTGTGCGAGGAAACGAAGCAATAACCCGATCAGCGCATGGTGAAGATGGATAACAAACTGTCAAACGAA
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SEQ ID NO: 27 (EHEC)

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SEQ ID NO: 28 (EAEC)

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SEQ ID NO: 29 (*Burkholderia fungorum*)

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SEQ ID NO: 30 (EPEC)

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SEQ ID NO: 31 (Shigella)

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 GTGGTGCATCAATGCCCTGGGGTAGTGCATAGCTAGCGGACTGACAGCCTCGCATTGGCAGACAATCAGTGGCCAGCGAAGCCTA
 ATACTCAATGCCCTGGCGTTATTCAAAGCATTGGTAAATTGCTATTGCTATGGGGACTCTTCAAAGCGGAAGGAGCAAAC
 GCCATTGCCCTGGGGCGTAGCAGTGTAGCTAGCGGACTGACAGCCTCGCATTGGCAGACAATCAGTGGCCAGCGAAGCCTA
 TTGCGATAGGTGCTGAGACCGAAGCCGCTGAAAATGCAACTGCTATTGCAATAATGCGAAGGAAAAGGGACTAATAGCATGGCAAT
 GGGGTCGGAAGCCTGCCGATAAGTCATAACTATCGCATTAGGAAATGGCAGCCAGGCTCTGGCAGATAATGCAATGCCATAGGC
 CAGGGCAACAAAGCTGATGGCGTGGATGCCATCGCTCTGGTAATGGTAGCCAGTCGAGAGGCTAAACACCATTGCCCTAGGCACAG
 CCAGTAATGCAACTGGTGATAAGAGTCTTGCCTGGTAGTAATAGCAGTGCCAAACGGTATTAACCTCTGCGCTGGCGCAGATT
 CATTGCGGATTAGACAATACCGTCTCTGCGCAATAGTCATTAAAACGCAAGATCGTTAATGTGAAAATGGCGCGATCAAGTCT
 GACAGTACGATGCCATTAATGGTCACAGCTTATGCCATTAGCAGCTGGTAGCAGGAAAGGCTGGAGGGCTGCAGTAGAT
 GTTGTGACGGTACTGTTACAGCACCAACCTACAATTAAAAATGGTAGCAGGAAACGTTAGGGCTGCGCTGCTGACTTGATG
 AAAACACCCTGCAATGGGACCAAACCAAGGCAAATACAGCGCTGCTCATGGTACTAGTAGGCCAACTGCCAGCGTAATACCGATGT
 TCGGGATGGCACGATTCAGCCTCCAGTAAGGATGCCATTACGGTCCAACTGAAAGCTACCAATGACGATGTCGAAGCCAACACC
 ACCAATATCACCAACCTGACGGATTCCGTTGGTACCTCAGGCTGATGCCCTGCTCTGGAACGAAACTAAAAAGGCATTCACTGCAG
 CTCACGCCAGGATACCAACCGCAAATCACCAACGTTAAAGATGCCACTGACGGCTGACAGCACTGATGCTTAACGGCTCTCA
 GCTGAAAACCACCAACGATGCTGTGGCGACGAATACCAACATCGCCAATAACACTTCAATTGCCACTAACACCACCAACATC
 TCTAACCTGACTGAGACGGTACTAATCTGGTGAGGATGCCATTACGGTAGCCAGCTTATGACTTAAGCAGCAATATGCCACCTACTCGG
 CCGAGACCACCAACGCAAATAACCAACGTTAAAGATGGCGACCTGACGACTGGCAGCAGCGATGCCATTACGGCTCTCAGCTGAAAAC
 CACCAACGATGCCGTGGCGACGAATACCAACATCGCCACTAACACCACCAACATCTCAATTGACTGAGACGGTACTAATCT
 GGTGAGGATGCCGTGAAATGGGATAAGGACAATGGTGCTTCACTGCGCTCATGGCAACAATACGCCAGCAAATCCAATATCC
 TGGACGGCACAGTCAGCAACCAGTCCGATGCCATTACGGTAGCCAGCTTATGACTTAAGCAGCAATATGCCACCTACTCGG
 CGGCAATGCTCTGTGAATACTGACGGTGTGTTACCGGTCACCTACAAAATGGTAAACAAATTATTATAACGTCGGCGATGCA
 CTGGCTCGATTACTCCCTCAATTAGCACGTCTCTGGCGATGCTCTGCTTGGGATGCCACCGCAGGTAAATTCACTGCCAAACACG
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 TGCCAGCAGCGATTAACGGCTCACAACTCTATACCAACATAGTACATCGCTGATGCCGTGGTGGTGACCGAGAAGTCAAC
 GCTGACGGCACCATCACCGCACCGACTTACACCATTGCGAACGCCAGTACAACACGTCGGTACGCCCTGGATGCCGTTGATGATA
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 TGGAGCGGTGCCACTACGCCAACAGTACTTCAACGCCACTAACGGCAGAACGACTCACTGCCGTTGGTAGCAGAACGCTAT

ATGGGTGCGAAACTGTCGTTAATGGTAATGCAGGTATTGGTATCGGTTGAACACTCTGGTTCTGGCTGATGCGATCAACGGCATTG
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CACCGCCTACAACATGGACGCACCGCAGAACTCTGTAGGTGAGTTCTGTCGGTAGTGAAGACGGTCAACGTCAGATCACAAACGTC
GCAGCTGGTTAGCGGATAACCGATGCGGTTAACGTGGTCAGTTGAAAGTCACTGATGAGCGCGTAGCGCAAAATACCCAGAGCATT
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CAAGTACTTCAGACCAACACCGATGCCCTAGATGCCAACGCCAGGGTAAAGATAGCGTTGCTATTGGTTCTGGTCCATTGCTGCC
GCTGACACAGCGTCGCACTGGGTACCGGTTCCGTTGCAGAGGAAGAAAATACAATCTCTGTAGTTCTTCTACTAACCAACGCCGGA
TCACCAACGTAGCTGCCAGTGTAAATGCCACCGATGCGGTTAACGTGTCGAGCTGAAATCTCTGAAGCAGGCGAGTGCCTACGA
CACCAAAGCTGATGGTTCTATCGACTATAGCAATATCACCCCTCGGTGGCAACGGCAGTACGACTCGTATCAGCAACGTCTCCGCT
GGCGTCACACAGACGCGGTGAACTAGCGCAGTTGAAGCAAAGCGCGCAGGAAACGAAGCAATACACCGATCAGCGCATGGTTG
AGATGGATAACAAACTGTCTAAACTGAAAGCAAGTTGAGCGGTGGTATCGCTTCTGCAATGGCAATGACCGGTCTGCCGCAGGCTTA
TACACCGGGTGCCAGCATGGCTTCTATTGGTGGCGGTACTTACAACGGTGAATCGGAGTTGCTTAGGTGTATCGATGGTGAGCGCC
AATGGTCGTTGGGTCTACAAATTACAAGGTAGTACCAATAGCCAGGGTGAATACTCCGCCGCACTCGGTGCCGGTATTCAAGTGGTAA

SEQ ID NO: 32 (Brucella melitensis)

ATGTCTTTTAAAAAATATCGATAACAGCCATGGGTGGCTTGATGTTGTCGCTGCAGTCGACGCTGCGAAGGCAGGAAA
ATGTTCGCAGGTGAAACTCCTCCTGTTTGAGCTGTTGAAAACCAGGGGCTGGCCAATATTGCTCTGATTGACCTCG
AGTGATAGGCCAGACAACAACCTACGTCCTGGGGCATTGTGTCTGGGATCGCTGGTCTTGACTCTCGGGCAGGAGAACGCAAC
CTAATTAGTGAAAATAGGCAAGTTATTAATAACAATACGACTGCCATTGCCAGAACGATTACCTCGATTAGTACCAATGCCAAGGGCG
TTGCCGACAATAGGGCTGCTATCAGACAGAACAGTGCTGCGATTCCGCTCTGCCAGCGAGTTGACGGGTTGCAAGGTCA
CAGCGCCGGAAAGAGGCACGTGCCGGAGCTGCAAATGCCGCTCTCGGGCTAACGATATGATAACCGTCCAGGCAAGGTGTCA
ATCGCTACCGGTGTTGGCGCTTAAAGGTAGCACCGCTTGGCTGGTACCGTTACACAAGCAAGAACGAAACGCTCGTTATA
ACGTGAGTGTAGCTTACAACGAAGCTGGCACATCCTGGAATGCAGGTGCAAGCTTACGCTTAACCAA

SEQ ID NO: 33 (Brucella suis)

ATGTCTTTTAAAAAAATATCGATAACAGCCATGGGTGGCTTGATGTTGTCGCTGCAGTCGACGCTGCGAAGGCGGAGGAAA
ATGTTCGCAGGTGAAACTCCTCCTGTTTGAGCTTGTGAAAACCAGGGGCTGGCCAATTGCTCTGATTGACCTCG
AGTGATAGCGCCAGACAACAACCTACGTCTGGGGCATCGTGTCTGGGATCGCTGGTCTTCTGACTCTCGGGCAGGAGAACGCAAC
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AGAGGCACGTGCCGGAGCTGCAAATGCCGCTGCTTGGGCTAAGATATGATAACCGTCCAGGCAAGGTGTCATCGCTACCGGT
GTTGGCGGCTTAAAGGTAGCACCCTGGCTGGTACACAAAGCAAGAACGAAACGCTCGTTATAACGTGAGTGTAG
CTTACAACGAAGCTGGCACATCCTGGAATGCAGGTGCAAGCTTACGCTTAACCAA

SEQ ID NO: 34 (*Ralstonia solanacearum*)

GTGGTTTCAGCGCCATGCCGCAATACGCTTGCAGAAATGTTGCTGCAAAACGATCCGGGAACGAATTGTGGAAGCGTGGGTGATG
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CAATAGCCTGGGTCAACTATCGCCTGGTACGAACATTCTCGTCTACGGGTCGACGCTCCGTGCTGGTATGAATGACGAAGTGACACCC
CTCGATTGATGAATATCGGTGCCATCTGACGTATGGGGAGCCAGCGGCTTCACGGCGGTGTCGATATGAATAATTCCGCCATCA
AAAACCTTGCTGACGGCACGCTGTCGGCCACCAGCACCGAGGCAGGTGACTGGCAGGCAACTGAACGCCACCAACACGAACATCACCAA
CTGCAGAACAGCATCAAGAGCATCAGCAGTTCGGCGAGCCTGGTGCAGCAGTCCTCCGCGGGCAAGGACATCACAGTCGCCAAGGAC
CTGGACGGTGACGCCGGTGGACTTCAGCGCAAGAAGCTGAGTGCAGCACGACGTTTCCTGCAGGCTGACGGGTGTCGGCGAGGGGA
CGTTGTCGGCGACGAGCACGGATGCGGTGAGCGGCAAGCAACTCTACGACCAACCAGAACCTGAGCACGACCAACCAGAACATCTGGC
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ATCAGCGCGGCTCGCGGGTCTGGTGCAGCAATCGGCCGCGGCAAGGACATCACGGTGGCCAAGGACCTGGACGGTGAGGCAGGTGG
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ACGACGCCGAGGGCAATCTGTCGTGAACACGACGAGCATCACGAACCTGCAGAACACCATCAAGAACATCACGCGCGGCTCGCGG
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CATCACGAACCTGCAGAACACGGTGAACAACATCAGCAGCGGTTGGCGGGCTGGTGCAGCAGTCGGCCGGCAAGGACATCACG
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 ACCATCAAGAACATCAGCGGCGCTCGCGGGTCTGGTGCAGCAATCGGCTGCGGGCAAGGACATCACCGTGGCAAGGACCTGGACG
 GTGACCGGTGGACTTCAGCGGAAGAACCTGAGCGACAGCACGACGTTCTGCCAAGCTGACGGTGTGGGGACGCTGAGCTGTC
 CGCGACGAGTACCGATGCCGAGGCCAACGCTCTATACGACCAACCAGAACCTGACGCCAGAACACACGGTAACAACATCAGCA
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 CGGCAAGAAGCTGAGCGACAGCACGACCTCGCGCAAGCTGACGGTGTGGCGAGGGACGCTGCGACGAGCACGGATGCG
 GTGAGCGGCAAGCAGCTATGCGACGAGCACGACGACCTCGCGCAAGCTGACGGTGTGGCGAGGGACGCTGCGACGAGCACGGATGCG
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 CCTCGAGTCGATCGCTCGCGCGCAGCCGTGCGGGCGGTATGAACCTCGATGGCGATGGCGCAATGCCCGGGCGGTGGCGGGC
 AACGCTGTGGCCTTGGCGGGTTCGGTGGCGACCGCGCGAAGACACGGTGTGGCTGGCGGGCAAGGAGCGCCAGATCACCA
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 GCGAATGCGAAGGCGACGGCGAATCATGCCGTGGCTCGGGTCTGGGTTCGGTAGCGAACCGCGCGAACACGATGTCGGTGGCTCGG
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 TGC GGCGTGGCGATCTGCCGGCGGACGACGGCCAGGCAGTACCGATGAGCAGATCGGATGGTGCAGGCGAGGGATCAGCCAG
 GTGGCGCGCGGCGCTTACAGCGGTATCGCGCGGCGACCGCGCTGACGATGATTCCGGACGTCGATCAGGCAAGTCGATCGCGATCG
 GTATCGGCAGCGCGACCTACAAGGGCTATCAGGCGGTGCGCTGGCGCCTCGGCACGCATCTGCACAACCTGAAGGCCAAGATGGG
 CGTGGGCTACAGCAGCGAAGGCACGACGGTCGGCATGGCGCGTGTATCAGTGGTAA

SEQ ID NO: 35 (*Sinorhizobium meliloti*)

GTGGCGCTGGGACGCCAACGGTCTCGGCCGGCAGCGGTTCACTTGCATTGGTAACGGTAGTTACGCAATTCAAACGGATCGGTTG
 CCATCGGGCAGTCTGCATACGCCAACGGTCAATCGCAATCGGTGGAGATGATGCCCTCGCTGGCGAGAGGCCAGCAGAC
 CAAGGCCGGGGCTCCCAGTCGATGCCATGGCGTGCCTGCGTACGAAATCGCTGGTAGTCGACGCCAGGATACGGTGGCCAAC
 GAAGCGGACCCGGCGCGCGTCTGATGCCATTGCAATCGGTACGGATGCACAGGCCAATGGCGACCGGTCTCGCCATCGGAGAC
 AGAATCAGGCCGGCAATGAGCAATCCATCGGATCGCGCGGGCAACACGGCAACAGGCCAAACTCTCGATCGGATCGGAGCGCAA
 CGTGGCCAGCGCGAGCAATCCCTAAGCCTCGGCCGGCAACAATGCCCTGGGCGAGGCTCCGTACGCATCGGACGCCAGTCAAGCCAGCGAGCG
 GCCGGCGGTCTCGGTGATCGCTTCCGGTGCCTGCGAGTACGAAAGGCCAATCTAGATATTCCGGATGACGTGGCCCGATCG
 ACGCCATCGCTATCGGTACCAATACCAAGGCCAACGGCACCGGTCCGTACGCATCGGACGCCAGTCAAGCCAGCGAGCG
 CAGTATTGGCGATGCAAGCCAAGGCTGTGGGTGACAAATCCGTACGTATCGGTACCGAAAGCTGGGCGATGGCGACGAATCGGTACGC
 ATCGGCCTCGTCAACAACGCCGGTTGAAGGGATGACCGAATCAAAGGCCAAACCTCTGTCAAGCCTGGGAGCCTTCAATCAGT
 CGCCGGGCATCGAGGCCATTGCTATCGGTGCCAGAAACGCAATGCCATCGGATCGGTGATTGCAATCGCTCGCTGCAGAAACGAA
 GGCGCCGATCCGGCGCAGGCCGGACGGCGTGCCTGCGCGACGCCGTGCTATAGGCACGGATGCGCTGGCCAACGACGCCAGGGTCCATC
 AGCATAGGCTGGAATAGCAGTACCTCCCTGAACTCCATCAGCATCGGTACCCGAGCCACGTCGGGATCGCGGGCGATATCATGA
 TCGGCACAGGTTCAAGGACTGGTCCACCTCCGGTCAGAACAAATGTCGCCCTCGCGTGCAGGCGAGTCAGAAGGTGAAGGGGTCGTC
 AACATAGCGATCGGCATTGGCGGGCGGTTCGGGAAAGCGATAACAAACGTCGCCATAGGCACCAATGCCGGAAATCCAGTTTCC
 GCGCTCGCAGCG
 CGGCGCCATCGGCGATCCGACCGATAATCACCGGTACCGGCTCCTACTCGCTGGCAACGACAACACCAACGCCGGCGGCGGCGGCGGCGGCG
 ACCTTCGGCAACGACAACACATTGGCGGATGCCGCGATGGCAGCCGCTACGGCAACGCAACAAATATCGATGTCGCGATGCCT
 TCGTGCCTGGCAATGGTGCCTGACGGTACCGAAGTCGGCGGCGTGGCGCTGGGTTCCGGCTGGTTCGGATACGGGCGACGTGGC
 GGGCTATGTGCCGGCGGGCGCTCGACGGCGACCAAAACGCCATCGAGGCGACGCGAGAGCACGCCGGCGGCGTGCCTCGGCAAT
 CGGACGCCAACCGCGCTACCGCCAGATCACAGGTGTCGCCGGCGACGCCGACTCCGATGCCCAACGTCAGGCCAGCTCA
 AATCGGTGAGACGATGCCAAGACAGGCTGGAAGGCTACGACGGACAGCGGAGCATCGACGCCATCGGGCGGGCGACGAGTTGGT
 CCTCAAAGGCCGACGCCAATCGTGTACGCAATCAGATCTTGGAGCAACGACGTCAGCATCGATCTGCCGATGAGATCGAGGTG
 AACAGGGTGACGCCGAGAGATCCCGACACGGGTGCACTCACGGTGCTGGACGAGAACGGCTGAGCTTACGACGCCAGGACGCCAAC
 GGGAGGACACGCCGCTCGGCCCGCGTGCAGGCCGGCGGCGATCCAAGCGGCCGAAACATACCAATGTCGCTGCCGGCGAGGCCGA
 CACCGACGCCGGTGAACCTTCCAGCTCAGGCCAGTCAGGCAACTCGAGGCCATCGGGCAATACCGACGCCGGCGTCAAATATGACTGGACC
 GACGCCAATACGAATGGCGTACGATGAGGGCGAACTCAACCTCGATAGCGTACGCCCTTGGCGGGGGCGATGGGCCGACCCAGGATCT
 CCAATCTGCCCGGCCCTTGAGCGGCCATCGACCGATGCCGTCAGGCCAGCTTCCGGCTTCCGAGGCCGTATCCAA
 CGTGGCCGTCGCCCTGGCGGGGGAGGCCGCTATGACCCCTGTCAGGATGAGTGAGCTGCCCGAAACATACGATCGGCCGACCGAC

TACAGCAATGTCGGCGACCGCCTGGCGGGCACGGCGGTGGGAGGCTCTCGCGCAGGGTGCAGCGTCCA
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 CGACCTGGCGACGATCTGGACGTCTCCGAAAGCATCACGGTGGGTGCCGATCCCGATCCGAATGCGCCGACCAACTGTTATCACC
 GGCGGTTGATCGTGGCATCGGACGGCAGCACCATGCTCGGAGCAACGGCTGGTCATCACCGGGGCCAGCGTACGACCGATGGCATCG
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 CGTCGTTGCGAACTGGCGATGGCGTCGGCTATGACGACAAAGCAACGGCACCCGTACGCTGGAGCGCTAACGGCACCAAG
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 AGGGCGTGAAGCGACCGACCCGTCAATGTCGGCCAGCTCGACGAAGCGTGGCGAACAGCTACACGGACGAAAGACCG
 AGTGGCGATCGATCAGCGGCCATCTACACCGACCAGGTTATCGAGAGACCAAGGTGAGCGCGGTGAACAATTATGCGCAACAACGGTT
 CGCGCAGCTCTCGGGCGAGATCGGGCAGGTTGGAGCGAAGCGCGGCAAGCCGCCATCGGACTTGCAGGCCCTCGCTGCGCTTC
 GACAATGAGCCGGCAAGCTGAGCGTGGCGCTCGCGGGCTCTGGAGAGAAGCGAAGGGCGCTCGCCTCGGTGCCGGTACACCA
 GCGAAGACGGACCGTCCGGCGAACCTGACCGGTGCTGCCGGCGGGGGAACGTCGGTGTGCCGGCTCAGCATCACGCTCAA
 CTGA

SEQ ID NO: 36 (*Bradorhizobium japonicum*)

GTGCGGGCCTTCGGCTCCGGCAACGCCATCAACGGCACCAACTACGCGGCCGTCGGCTCCAACAACGTCGCGCCGCAACAACGGCG
 CGGTTGTCGGCTCCGGCAACGGCGTCACCGCGACAACACCCGCGCTTCGGCTCCAGTATCGGCATCGCCGGCGCAACAACGGCG
 TGCGGCTCCTCAGCACCGTCACCGCGAGCAACAGCGCGCTGTTGGCTCCTCAACAACGTCAGCGGAATAACAGCGCGCCTT
 GGCACCGGACAGAACATCCCGGTAAACGGCACGTTGCCATCGCGATCCCAACATCGTAACGGCAACAACAGTTGGTGTTCGGCG
 ACAACAAACACGGTAACGGTCAAATGTGGCGGTGCGCGACAACATCCAGCTGGTGGCTCGAACAAACACCATTGCGCAACGTC
 CAGCGCCGCCGGCTCATCCGTGTTGGCAGCGAACACCGTCAACGCCACCAATGCCGTGGTATGGCAACAACAGCACCGTCTCC
 GGCGCGTCCCTGTGCGATCGGCAATGGCACGGCGTTACCGCATCAACCGGATCGCGATGGGACCGGCCGGCGAATTTCG
 ACAACTCGGTGCGATCGGAGCGCGGCGAACACGACGCGCCAACCAGGTGCGAGTCGGCACCGCCAGCAGCACCTACACGATGAG
 CGGCATCACCTCGGCTGCGAGCAAGGCGCGAGTCCGGACCCAGCTCGTCACATCGGACCGGCCGGCAATCTGGCGACCAACC
 TCGCTGGCTGGCCTCGGACTTGCCCTCGGCCGGGACATCAACGGAATCAACTCCAACTGGCCGCCCTAACGGCCGTCGACAACC
 TGACACGGGAGTCGCGCGCGTGGCGTCCAGCCTGCAATTGATCCTCGCCCGCAAGATCTCGGTCTC
 CGGCGGCTCGGCAATTCCAGGGACAATCCGGCTCGCGCTGGCTATTCCATTGGACGCCATCGCCTAACGCGCG
 TTCACGGCCGACAGCAAGGCGCATCGCGTCAGGGCGCGTCGTGGACGCTGAAGTGA

SEQ ID NO: 37 (*Nada*)

MSMKHPSKVLTTAILFCGALAAATSDDVKKAAATVAIAVAYNNGQEINGFKAGETIYDGEDGTITQKDATAADVEADDFKGLGL
 KKVTNLTKTVNENKQNVDAVKAAESEIEKLTTKLADTDAAALADTDAAALDETTNALNKGGENITTFAEETKTNIVKIDEKLEAVADT
 VDKHAEAFNDIADSLDETNTKADEAVKTANEAKQTAEEETKQNVDAVKAAETAAGKAEAAAGTANTAADKAEAAVAKVTDIKADIATN
 KADIAKNSARIDSLSKDNVANLRKETRQGLAEQAALSGLFQPYNVGRFNVTAAVGGYKSESAVAIGTGFRTENFAAKAGVAVGTSSGS
 SAAYHVGVNYEW

SEQ ID NO: 38 (*Yada*)

MTKDFKISVSAALISALFSSPYAFADDYDGIPNLTAQISPNADEPALGLEYPVRPPVPGAGGLNASAKGIHSIAIGATAEAAKGAAVA
 VGAGSIATGVNSVAIGPLSKALGDSAVTYGAASTAQKDGVAIGARASTSDTGVAVGFNSKADAKNSVAIGHSSHVAANHGYSIAIGDR
 SKTDRENSVSIGHESLNRLTHLAAGTKDTDAVNVAQLKKEIETQENTNKRSAELLANANAYADNKSSVLGIANNYTDKSAETLE
 NARKEAFAQSKDVLNMIK^HNSVARTTLETAEEHANSVARTTLEEEHANKSAEALASANVYADSKSSHTXTANSYTDVTVSNS
 TKAIRESNQYIDIKERADT^KLDTRVDKGASSA^LNSI^TQ^GVGVNP^TAGVGGYR^SS^A^LA^IGSGYKVNENVALKAGVAYA
 GGSDVMYNASFN^T^W

SEQ ID NO: 39 (*Consensus*)

MXXMXXXXXXLAXAIXAXFSXGALAAXTXXXXTGPAXXXVIXXPAXXXLXXXXXXXXXXXXXXGLXAXAXXXXSSXADAEAXVFK
 GLXXXXXXPNIXXXXXXXQTKDQIAMLIRXXXNLXENKXXVXXVAAIKXIPKDLIAKXADVDXXXXVXXAXXRTXAXNNLKGHS
 SHVAANHGYSIAIGDRSKTDRENSVSIGHESLNRLXXXAXXXKEEXXENIAQIDXNXEQXXEXDKXXEXXNXXXXLAXXXXAXX
 XAXXVNXXXXXXXXXXTXNLXQKIAEXXXNxDAXXXKAXXXXXXXXXXXXXXXAXNTKDIXLXTXXXNSAXXAA
 XTXXIATEXSXXFEXXXXXXXQXXQXXIANXTXVAIXEQIXXNTARIIDXLDRVNXLKDExKAGLASQALSGLFQPYNVGKLNVSA
 AVGGYXSSXAXAIGXGSXRFNENXAAKAGVAXDTQXGGSSAGYXVGVNFEW

SEQ ID NO: 40 (primer)

TATCGGCAAACGACGCAAGC

SEQ ID NO: 41 (primer)

GGCGATTAGCCATTGATAC

SEQ ID NO: 55 (Histone acetyltransferase)

MINENLAYLSVLPLEDVKIERSSFSCSVEPLENYFKYVSQDVKKGLAKCFVLINAQPSRIVGYYTLSALSIPIDIPQERISKGVY
PNIPAVLIGRLAIDTNFQKQGYGKFLIADAIKIKNATVAATILVVEAKNDDASSFYERLGFIEFKEFGGTHRKLFYPLT

SEQ ID NO: 56

GCAAGCCAAGTAACAGTAATGTTAATTAGGTATGTTAAATTCTGTTTATCACA
TAGCAATGTGGGTTCTGTATTGGTAT
TAACCAAATTACCGATTAATAAGCGTAATTAAAGTTAATATCTTGTGGTACATTAA
AGAATACAAATGCCATCACCTAGTG

SEQ ID NO: 57

GCAAGCCAAGTAACAGTAATGTTAATTAGGTATGTTAAATTCTGTTTATCACA
TAGCAATGTGGGTTCTGTATTGGTAT
TAACCAAATTACCGATTAATAAGCGTAATTAAAGTTAATATCTTGTGGTACATTAA
AGAATACAAATGCCATCGCCTAGTG

SEQ ID NO: 58

GCAAGCCAAGTAACAGTAATGTTAATTAGGTATGTTAAATTCTGTTTATCACA
TAGCAATGTGGGTTCTGTATTGGTAT
TAACCAAATTACCGATTAATAAGCGTAATTAAAGTTAATATCTTGTGGTACATTAA
AGAATACAAATGCCATCGCCTAGTG

SEQ ID NO: 59

GCAAGCCAAGTAACAGTAATGTTAATTAGGTATGTTAAATTCTGTTTATCACA
TAGCAATGTGGGTTCTGTATTGGTAT
TAACCAAATTACCGATTAATAAGCGTAATTAAAGTTAATATCTTGTGGTACATTAA
AGAATACAAATGCCATCGCCTAGTG

SEQ ID NO: 60

GCAAGCCAAGTAACAGTAATGTTAATTAGGTATGTTAAATTCTGTTTATCACA
TAGCAATGTGGGTTCTGTATTGGTAT
TAACCAAATTACCGATTAATAAGCGTAATTAAAGTTAATATCTTGTGGTACATTAA
AGAATACAAATGCCATCGCCTAGTG

SEQ ID NO: 61

GCAAGCCAAGTAACAGTAATGTTAATTAGGTATGTTAAATTCTGTTTATCACA
TAGCAATAGAAAATGAGGATTCTGTATTGGTAT
TAACCAAATTACCGATTAATAAGCGTAATTAAAGTTAATATCTTGTGGCACATTAA
AGAATACAAATGCCATCGCCTAGTG

SEQ ID NO: 62

TTAGGTATGATTAAATTCTG

SEQ ID NO: 63

ATAGTATAGTTACTTGTCTAGTCACTTAATAACCTAAATAATTGAGGATTCTTATGAAAAGAAATTAT

SEQ ID NO: 64

CCGACGCAAGCCAAGTAATAGTAATATTAAATTAGGTATGATGTAATTCTGCTTGAGGCAAATTTCACATAGGAAATTCTATAT
TGCTTAACGTTTTATAGTAGAAGTATATACTCAGTTATGGTTATGGTACATAGTATAGTTTACTTGTCTAGTCACTTA
ATAACCTAAATAATTGAGGATTCTTATGAAAAGAAATTATTAAACAACTGTAATCGCTGTGTTAGGTGGCACTACTGTT
CTAATTATGCTTAGCACAAGCACAAGCACAAGC

SEQ ID NO: 65

AGGATACGAAAATATCGGCAAACGACGCAAGCCAAGTAACAGTAATGTTAGGCTTGTATAGTATAGCTTGCTTGTCTAGTTCA
ATTAAATAATCTAAATAATTAGGATTCTTATGAAAAAAATTATAGGCTTCGCACACTCGTTGCTAGTATAGATATGTG
AATA